



Comments on Proposed Title 24 Changes

March 20, 2008

The Natural Resource Defense Council (NRDC) appreciates the opportunity to comment on the proposed 2008 Title 24 code changes. While we are very supportive of the 45 day language and the types of changes it includes, the proposed language fails to properly address the efficiency of air conditioners currently being installed in new homes in California. Our comments focus on the need to remove a loop-hole that exists and includes a brief summary of the issues involved and a recommendation on how to fix the problem. The fix is exceedingly simple and only requires a modest change to the Alternative Compliance Method (ACM) manual. Our proposal is consistent with the proposals made previously by PG&E and its consultants on this topic throughout the 2008 code revision process.

We urge the CEC to adopt this change due to the significant potential benefits it will provide:

- First-Year peak reductions of 3.7 MW (increases 2008 Title-24 residential demand savings by 11%)
- 75 GWh electricity saved over ten years
- 45,000 tons of CO₂ offset over ten years

Background

The existing ACM provides an energy credit for a high Energy Efficiency Ratio (EER) Air Conditioner. The current baseline EER is 10. The credit allows builders to reach compliance by installing a high-efficiency air conditioner, in lieu of a tighter envelope or better windows, for example. The National standard for air conditioners, set by the National Appliance Energy Conservation Act (NAECA), requires a Seasonal Energy Efficiency Ratio (SEER) of at least 13. Almost all air conditioners built in the U.S. with a SEER 13 have an EER of at least 10, most higher. Therefore, it is almost impossible to *not* achieve the high EER credit in the performance approach and the baseline needs to be adjusted to stop this. Stated another way, the energy budget for a typical home assumes an EER of 10, even though virtually all the new HVAC units installed in production homes are 11 or higher. As a result of this low baseline, the state has essentially weakened the standard by as much as 7% in some climate zones. This low baseline translates to builder decisions to decrease efficiency elsewhere in the home.

If the baseline EER were increased to 11, the loop-hole would be closed, gaining energy savings, increasing the stringency of the code and improving envelope construction

The conservatively estimated first year energy savings from this change amount to approximately 1.6 GWh/yr and 3.7MW of peak reduction. Considering the 97.9 GWh/yr and 33.5MW (peak) of savings in the single-family residential sector estimated in the November 7th, 2007 Impact Analysis, this change would increase the electrical energy savings from the current proposed 2008 Title 24 changes by an additional 1.6% reduction in total energy use and increase the statewide electrical demand savings by an 11%, for this sector. Furthermore, the

potential energy savings from this measure would reduce CO2 emissions over the next ten years by approximately 45,000 tons. This change will also help California meet its mandates to reduce its global warming emissions. Leaving such an easily achievable energy reduction proposal on the table, only to be potentially adopted in 2012, would be a mistake

Recommended Change

NRDC is fully supportive of the analysis and code modification proposed by PG&E in their November 16, 2007 submittal proposal entitled “Revise Default EER in ACM,” and their follow-on comments dated January 3, 2008.

The changes that are needed leave the main part of the standard unchanged and only require a minor and straight-forward change to the ACM manual. Our recommendation is to make the following change to the ACM manual, Note that the original language is in black, added language is in blue and underlined and stricken language is in ~~red font and with a strikethrough~~:

Residential ACM

RACM Section 3.6.4 Cooling Equipment

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Standard Design. The cooling system for the *Standard Design* building with a central system shall be of the same type identified in the Appliance Efficiency Regulations and selected for the proposed design with a SEER meeting the Appliance Efficiency Regulations minimum requirements. For non-ducted non-central cooling equipment, the efficiencies shall be from the Appliance Efficiency Regulations for Room Air Conditioners, Room Air Conditioning Heat Pumps, Package Terminal Air Conditioners and Package Terminal Heat Pumps for the type and size in the *Proposed Design* where the size may be a user input or shall default to 24 Btu per hour per square foot of conditioned floor area. When a *Proposed Design* uses both a split system air conditioner and another type of air conditioner, the *Standard Design* SEER shall be a conditioned floor area weighted average of the SEERs of the cooling equipment. The EER used for calculating the energy consumption of a SEER rated standard central air conditioner shall be the lesser of the EER rating of the air conditioner used in the proposed design or the default EER calculated in Equation R4-41 for the SEER value meeting the Appliance Efficiency Regulations minimum requirements.

RACM Section 4.7.1 Cooling System Energy

Equation R4-41

When

$$\begin{aligned} \text{SEER} < 11.5 \text{ EER} &= 10 - (11.5 - \text{SEER}) \times 0.83 \\ \text{SEER} \geq 11.5 \text{ EER} &= 10 \end{aligned}$$

$$\begin{aligned} \text{SEER} < 12.7 \text{ EER} &= 0.455 + \text{SEER} \times 0.83 \\ \text{SEER} \geq 12.7 \text{ EER} &= 11.0 \end{aligned}$$

Nonresidential ACM

NACM Section 2.5.2.7 Equipment Performance of Air Conditioners with SEER Ratings and Heat Pumps with SEER and HSPF Ratings

Standard Design: The standard design shall use performance curves based on the SEER of the equipment required by the Standards. The default EER, as defined below shall be used. The standard design heat pump shall have an HSPF as required by section 111. The COP at 47° F shall be determined as below. The efficiency at other outdoor temperatures shall be based on the default DOE-2 HEAT-EIR-FT curve....

The EER for different EWB and ODB conditions. These are given by the following equations.

Equation N2-1 $EER_{67,82} = SEER$

~~Equation N2-2 $EER_{67,95} = \text{From Manufacturer Data [when available]}$
 $= 10 - (11.5 - SEER) \times 0.83$ [default to $SEER < 11.5$]
 $= 10$ [default to $SEER \geq 11.5$]~~

Equation N2-2 $EER_{67,95} = \text{From Manufacturer Data [when available]}$
 $= 0.455 + SEER \times 0.83$ [default to $SEER < 12.7$]
 $= 11$ [default to $SEER \geq 12.7$]

This change simply and effectively raises the baseline EER from 10 to 11, closing the loop-hole.

While this change does have the equivalent impact of tightening the standard, builders will have multiple cost effective paths to attain compliance through widely available building technologies and practices. These include, but are not limited to:

- Installing a unit with an EER above 11
- Increasing insulation
- Tightening the envelope
- Lowering the SHGC of windows

Regarding potential pre-emption issues, the standard does not require a specific air conditioner EER efficiency. The ACM change would more accurately reflect the efficiency of the majority of the units being installed today as part of its base case. Builders who want to install a unit with a lower EER are not prevented from doing so; they could install an air conditioner with an EER less than 11 with no penalty. The PG&E proposal would treat the standard design case as having the same EER as the proposed design when the standard design EER is less than 11. Furthermore, the current standard, EER 10, could also be considered pre-emptive as some SEER 13 units have an EER below 10. For the same rationale that an EER 10 has been accepted, so should the increased EER. To summarize, the change to the ACM would not deny compliance to any units meeting the federal standard, it would simply give credit to units that deserve credit, those that go beyond common practice in California, thus avoiding any potential pre-emption.

Conclusions

Given the simplicity of the changes and the compelling benefits they provide, we urge the CEC to make the proposed change to its ACM manual as it finalizes the 2008 standards. To date, the only feedback we have heard from CEC staff on this point is that the proposal is too late. We respectfully want to remind the Commission that this issue has been previously raised on several occasions by PGE via oral and written testimony, dating back to June of 2007. Given the simplicity of the changes involved and the benefits they provide, we believe the changes can easily be made and incorporated into the final 15 day language.

We appreciate the opportunity to submit our recommendations to improve the code and are available to discuss this matter further with you.

Sincerely,

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CC: Noah Horowitz - NRDC